

BOARD OF INTERMEDIATE AND SECONDARY EDUCATION, PESHAWAR

Higher Secondary School Certificate (H.S.S.C.) Examination — Inter Part-I

Inter Part-I	CHEMISTRY Paper – XI (01) (21) · PR XI (001) 21	Fresh / Reappear 2021
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Instructions (printed in Urdu on the sheet): 1. Each question has four circles; fill in only the circle of the correct answer. 2. Use a blue or black pen to fill the circles. 3. Filling more than one circle will be treated as a wrong answer.

SECTION - A

Time Allowed: 20 Minutes

Marks: 18

1	Enthalpy means total heat content of a system at constant: ☐ Temperature ☐ Pressure ☐ Volume ☐ Moles
2	As the number of effective collisions between the reacting particles increase, the rate of reaction..... ☐ Decreases ☐ Increases ☐ Remains the same ☐ Depresses
3	If mole fraction one component of a solution is 0.3, then the mole fraction of second component of that solution will be..... ☐ 0.3 ☐ Zero ☐ 1 ☐ 0.7
4	The molal freezing point constant of a solution is called... ☐ Cryoscopic constant ☐ Ebullioscopic constant ☐ Gas constant ☐ Absolute zero
5	Which of the given is not a state function? ☐ Enthalpy ☐ Heat ☐ Temperature ☐ Pressure
6	The oxidation number of Cl in HClO_4 is..... ☐ +3 ☐ +5 ☐ +7 ☐ +1
7	Greater number of hydrogen bonds are found in..... ☐ HF ☐ H_2O ☐ NH_3 ☐ CH_4
8	London forces are strongest in..... ☐ F_2 ☐ Cl_2 ☐ Br_2 ☐ I_2
9	KNO_3 and NaNO_3 both have same Rhombohedral Crystal structure this phenomenon is.... ☐ Allotropy ☐ Polymorphism ☐ Anisotropy ☐ Isomorphism
10	$K_c > K_p$ if Δn is..... ☐ Zero ☐ +ve ☐ -ve ☐ None of these
11	The unit of K_w is..... ☐ $\text{mol} \cdot \text{dm}^3$ ☐ $\text{mol}^2 \cdot \text{dm}^{-6}$ ☐ $\text{mol}^{-2} \cdot \text{dm}^{-6}$ ☐ $\text{mol}^2 \cdot \text{dm}^{-3}$
12	For acidic solutions..... ☐ $\text{pH} < 7$ ☐ $\text{pH} > 7$ ☐ $\text{pH} = 7$ ☐ $\text{pH} \geq 7$
13	What will be the value of temperature and pressure at standard conditions i.e. STP? ☐ 100°C , 1 atm ☐ 298 K, 1 atm ☐ 273 K, 760 mmHg ☐ 0°C , 76 cm Hg
14	Bohr's theory cannot be applied on: ☐ H^{+1} ☐ He^{+1} ☐ Li^{+2} ☐ B^{+3}
15	Total number of orbitals in "M" shell are..... ☐ 2 ☐ 4 ☐ 5 ☐ 9
16	The bond angle in NH_3 is..... ☐ 90° ☐ 104.5° ☐ 107.5° ☐ 109.5°
17	Which one of the given will have linear geometry? ☐ BeCl_2 ☐ H_2O ☐ CH_4 ☐ BF_3
18	The value of ideal gas constant is..... $\text{atm} \cdot \text{dm}^3 \cdot \text{mol}^{-1} \cdot \text{K}^{-1}$ ☐ 0.0821 ☐ 1.98722 ☐ 62.364 ☐ 8.3143

Note: Time allowed for Section - B and Section - C is 2 Hours and 40 minutes.

SECTION - B

Marks: 40

Q-II Answer any TEN parts. Each part carries FOUR marks.

1. What is limiting reactant? How will you identify a limiting reactant?
2. Apply the Hund's rule for arrangement of electrons in equal energy orbitals of carbon and nitrogen elements.
3. Indicate the type of overlapping of orbitals which result in the formation of sigma (σ) Pi(π) bond.
4. Describe the Dalton's law of partial pressure. Is this law applicable for reacting gases?
5. Why is food cooked rapidly in pressure cooker?
6. Differentiate between isomorphism and polymorphism.
7. Derive a relationship between K_p and K_c .
8. How a buffer solution resist a change in pH?
9. Illustrate the importance of orientation of colliding molecules for a reaction to occur.
10. Prove that the sum of mole fractions of two components of a solution is equal to one.
11. Develop a relationship between heat supplied at constant pressure (q_p) and change in enthalpy (ΔH).
12. Why is BeCl_2 linear in shape while SnCl_2 possess angular geometry?
13. Balance the following equations by half reaction method.
 - (a) $\text{Sn}^{2+} + \text{I}_2 \rightarrow \text{Sn}^{4+} + \text{I}^-$ (Neutral medium)
 - (b) $\text{Zn} + \text{Cr}_2\text{O}_7^{2-} + \text{H}^+ \rightarrow \text{Zn}^{2+} + \text{Cr}^{3+} + \text{H}_2\text{O}$ (Acidic Medium)

SECTION - C

Marks: 27

Note: Attempt any THREE questions. All questions carry equal marks.

- Q-III (a) Derive an expression for the radius of hydrogen atom by applying Bohr's atom theory. (5)
 (b) How many moles are present in 7.5×10^{20} molecules of C_6H_6 ? (4)
- Q-IV (a) Give the experimental verification of Graham's law of diffusion. (5)
 (b) Draw molecular orbital diagram for oxygen molecule and also calculate its bond order. (4)
- Q-V (a) What is Le-Chatlier Principle? Apply this principle to see the effect of change in pressure and temperature on gaseous equilibrium. (5)
 (b) Define order of reaction. Give the examples of 1st, 2nd and 3rd order reactions. (4)
- Q-VI (a) What is elevation of boiling point? Derive an equation which relates elevation of boiling point with molecular mass of solute. (5)
 (b) Write short notes on: (4)
 (i) Azimuthal Quantum Number
 (ii) Electrode potential

Notes

1. Typeset from the board paper. Board wording, spelling and notation are reproduced as printed, including slips; nothing has been corrected.
2. The source answer sheet arrived with the bubbles already shaded in. Options are given unmarked; no answer key is included.
3. The Section A instructions are printed in Urdu on the board sheet; an English rendering is given here.
4. Kept as printed: Q.3 "If mole fraction one component"; Q.14 " H_e^{+1} "; Section B 3 labels the sigma bond with δ ; "Le-Chatlier".